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EDUCATIONAL NEWS AND EDITORIAL COMMENT

School Buildings

In Los Angeles a school building one story high is being built around three sides of a quadrangle 240×250 ft. A playground 190 ft. square will be inclosed by this building. There will be sixteen rooms, all lighted and ventilated from both sides. A double roof is to cover the whole so as to protect the rooms from excessive heat. This plan is, of course, best adapted to a warm climate, but it suggests the problem of school architecture as a living and important problem.

In Cincinnati the Health Department has taken a lively interest in the remodeling of several buildings. It recommends that two neighboring schools should be merged and the site of one used for a playground. The new building should have open-air rooms and more window space for ventilation.

In Tulsa, Oklahoma, an elementary school is to be built on the cottage plan with more air and light for each unit than can be obtained in the common school building.

In Gary, Indiana, the buildings have been planned with a view to using the corridors for entertainments and play; there are also swimming pools, shops, and large playgrounds connected with each building. By a lengthening of the school day, and a distribution of the children throughout the different parts of the building and grounds, the expense of this more elaborate equipment is so distributed that the cost per capita is less than in the ordinary school.

In Chicago a report of the Elizabeth McCormick Memorial Fund states that of 367 children who attended four schools on roofs

and seven in open window rooms, 90 per cent improved decidedly in general physical condition, 15 per cent sufficiently to be discharged as cured, 75 per cent gained in weight from two to eight and one-half pounds. The children in these schools are kept in the fresh air the year round, are given from two to three meals a day, and are required to rest at least one hour during the school period.

All these examples call attention to the fact that a change in the methods and scope of education calls for a change in school buildings. If play is useful in education, there must be a place for play. If the health of a child is a matter of legitimate concern on the part of the teacher, there must be more fresh air and more space for exercise. The school building is an embodiment of educational ideals and a modern school cannot flourish in an old-fashioned building, modeled after a private dwelling or a barn.

An All-Year-Round School

The Belmont Avenue and Seventh Avenue schools in Newark, N.J., were kept open during the past summer, and regular work was carried on in order to test the feasibility of a continuous school session. These schools were chosen because the population is such that most of the children in these districts are obliged to stay at home during vacation.

The average attendance of fourteen hundred children enrolled was 93 per cent. The enrolment represented 70 per cent of the total school population in these districts. The health of both pupils and teachers was good, because the windows were kept open all the time. There was more fresh air than usual in the rooms. The work was satisfactory in grade, more children being promoted at the end of the course than in the regular classes at other times in the year. The cost of conducting the schools was $6,500. By a very slight change in the organization of classes, the pupils are enabled to get the full advantage of their work during the summer, and will complete their elementary-school courses sooner by one-fourth than they could under the old vacation plan.

It will require only a few more experiments of this kind actually carried to successful completion to persuade school boards and teachers that a continuous school session is the only economical, efficient, and justifiable type of school organization.

Public Interest in Schools

Evidence of public interest in schools is nowhere more strikingly furnished than in reports of non-educational organizations which investigate from time to time the efficiency of public schools. The city of Cleveland has in the past two years had a trying experience in school matters. Politics have to an unjustifiable extent controlled the action of the School Board. It is interesting to note that an organization of Cleveland citizens, namely the Cleveland Engineering Society, has raised in definite form the question which the Board of Education ought to have faced some time ago: the question of efficiency of the school system. The engineers find that the efficiency of the system according to their standards is less than 50 per cent. The committee points out that frequent changes in policy affecting the course of study and promotion are demoralizing and incompatible with highest efficiency. Any form of dissension in the school organization is harmful.

These are wholesome words and should sink deep into the minds of all teachers and all boards of education. The slight respect with which business men and engineers frequently look upon school organization is due in very large measure to the instability of school plans and the short and uncertain tenure of school officers.

A different type of example of public interest in school matters is to be found in two reports recently issued by public associations in the city of Chicago. The City Club through its School Committee, and the Commercial Club through its special agent, Mr. Cooley, have both investigated the needs of the Chicago schools in respect to industrial education. Mr. Cooley's report is reviewed on a later page. The report of the City Club will be reviewed fully in a later issue of this Journal. The two reports are diametrically opposed in that one advocates separate vocational schools of secondary grade, the other advocates a genuine reform within the elementary schools, making much of the work of these schools vocational in type. The two programs will come up for legislative recognition in the state of Illinois during the coming winter. It is highly important that school officers be prepared to discuss the two plans fully and intelligently. One plan is being advocated and tried in Massachusetts, the other in New York. It is possible to get reports from both of these states.

Michigan Course of Study

The law of 1911 gives the State Superintendent of Schools in Michigan the authority to outline the course of study which must be followed in every district in the state. Heretofore this authority was vested in the district boards. One of the most important changes made in the new course is that requiring agriculture to be taught in every district school in the state. There is a practical difficulty in the way of this change in the fact that teachers are not prepared to give the course. A beginning is therefore all that is required at this time, namely, one-half year of agriculture in the eighth grade. However, a course of nature-study dealing with home gardening, crop planting, and other related subjects is introduced earlier. Later the course in agriculture is to be enlarged. The rural school is to be ruralized rather than allowed to go on reflecting in a weak and inefficient way the city schools.

Summer School for Teachers

The statistics from the summer schools of universities and normal schools show that the movement is progressing at a rapid rate. Fifteen years ago teachers felt that they must have a long vacation. This vacation was supposed to be of necessity a period of complete relaxation. Today a very respectable minority of the teachers of the country spend a major part of their time in study. The University of Chicago with its regular summer quarter and Columbia University with its shorter term of six weeks lead in point of numbers and in richness of curriculum. Each of these institutions had during the past summer the largest enrolment in its history, both passing the 3,500 mark. The Summer School of the South, one of the most influential factors in the educational reawakening of the South, enrolled nearly 2,500 teachers. Normal schools all over the country report more students than ever before. Commissioner Claxton at the end of a trip including a number of these institutions declared the movement one of the most significant in the educational history of the country. Such it certainly is. No longer can the teacher rest content with a normal-school training completed years ago. He must get himself into contact with the current enlargements in science, with the recent advances in

methods of study and instruction. He must learn of new types of educational organization and must study the efficiency of the new courses of study which are being tried out in parts of the country remote from his own home. It means much for the development of the schools of this country that teachers come together in this way to renew their student activities and prepare themselves to carry home the most progressive educational ideas.

Teachers' Organization

Several speakers and writers have recently called attention to the importance of developing a new type of Teachers' Association in this country. The utter failure of our present National Association to deal with professional problems is too conspicuous to need further comment. The Department of Superintendence is in a better position than the general Association to do something really worthy of the teaching profession. The English Guild furnishes a model to which we in America might well turn attention.

The promising line of organization is that which is suggested by the success of summer schools. Teachers can set up standards of professional efficiency and can develop the machinery for requiring conformity to these standards. They can judge schools better than any other agents of the public. They can supervise appointments better than irresponsible teachers' agencies which take an unwarranted percentage from teachers. The discussion of these problems is fortunately becoming more common where teachers come together. The idea that a teachers' meeting is a picnic or an excursion is gradually becoming less and less common. In short, the time is ripe for some strong and efficient organization like the Department of Superintendence to crystallize the movement toward a real teachers' association in America.

Grading Pupils on Home Work

The State Superintendent of Instruction in Missouri and the Rural School Inspector have devised a plan whereby a closer co-operation shall be established between the home and the school in the training of the children. A report card has been prepared on which the parent is to send to the school a statement of the home work of each pupil. Superintendent Evans comments on the plan as follows:

"This home work may be domestic, helping the mother, or it may be agricultural, helping the father, or of whatever character provided it be not aimless. Parents, especially in rural communities, have not been asked or invited to co-operate with the teacher in any definite, systematic way to correlate the work of the home with that of the school and as a result many pupils have been educated away from the farm and have formed a distaste for home life on the farm.

"Because the school has paid little attention to industrial education and the parent has failed to co-operate with the school in a way that would tend to attract the attention of the pupil to good sweeping, dusting, sewing, cooking, washing, tending stock, milking, caring for poultry, plowing, and industrial work generally, thousands of pupils have left the farms, rushed to the cities, and become consumers instead of producers.

"To the end that the attention of every pupil in the rural schools of the state may be directed toward the things that make better homes, more efficient citizens, this department has issued a definite and systematic method of reporting quarterly from teacher to parent on the progress made by the pupil in the school studies and a report from the parent to the teacher on the progress made by the pupil in such simple, but important, subjects as sweeping, dusting, cake-baking, bread-making, sewing, washing dishes, for the girls, and for the boys, currying horses, feeding stock, milking, caring for poultry.

"This report is to be signed by the teacher as the parent signs the report from the teacher.

"If this method is used efficiently by county superintendents and teachers throughout the state, a long step will be taken in the direction of better co-operation between the school and community."

Encouraging Home Work

Devices other than the grading of home work have been adopted in other states with a view to encouraging out-of-school work. In the state of Oregon the Bankers' Association in co-operation with the school authorities supports a director of home agricultural work. Of the 125,000 school children of that state 75,000 are reported to be engaged in

systematic agricultural work. In Idaho the State Department of Education is succeeding with the aid of the officers of the State Fair in bringing to the capital the children from the different counties in the state who have shown the highest degree of efficiency in potato raising and domestic work. This visit to the State Fair will be made the occasion for instruction to these children in agriculture and domestic science. In Iowa good roads clubs are formed among the boys and prizes are given to individuals and to clubs. In Wisconsin the following announcement is published:

"With the co-operation of the Wisconsin Experiment Association a corn-growing contest has been arranged for the school children of the county. The object is to stimulate an interest in, and disseminate information relative to, the proper selection of seed corn and modern methods of corn culture.

"A number of rules and regulations have been made to cover the contest. Exhibitors must be boys or girls between ten and eighteen years of age, attending school in the county. Golden Glow Wisconsin No. 12 seed will be used and no exhibitor will be allowed to enter more than one sample in any one class, but may enter in each of the three classes, namely sweepstakes, single ear, and corn on stalks. All samples in township classes will consist of ten ears, and all samples in 'corn on stalk' shall consist of not less than three stalks.

"Twenty-one premiums of $2.00 each will be offered. There will be twenty-one second premiums of $1.00 each, and twenty-one premiums of 50 cents each.

"The boy scoring highest in the sweepstakes class, and the boy scoring highest in the corn-on-stalk class will each receive a scholarship to the boys' one-week course in grain-judging at Madison.

"A special premium of $5.00 is offered to the teacher whose pupil receives first premium. This prize is offered by J. P. Bonzelet, of Eden.

"The contest will be conducted in conjunction with the county fair."

One brief item comes to hand showing that this type of interest is not confined to rural communities. The Poultry Association of

the city of Buffalo, N.Y., offers through the Board of Education to give free instruction in the breeding and care of fowl to the school children of that city.

These examples could be supplemented by descriptions of experiments in other states and cities. Each undertaking of this type shows how large a margin of unused energy there is among the boys and girls of the country and how urgently the demand for organized employment of this energy is felt by educators.

Out-of-School Reading

A typical example of library development is reported by the librarian of the city of Chicago. The figures which he presents for books circulated through the public schools during the last five years are as follows:

1907–8	666
1908–9	621
1909–10	1,362
1910–11	60,586
1911–12	77,996

These figures represent the growth of a new policy on the part of the library and a new interest in the schools. In some quarters it will doubtless be necessary for teachers to take the initiative in cultivating an interest in good outside reading and in creating the opportunity for such reading. Such out-of-school reading proves, as does out-of-school agricultural work, the possibility of extending widely the influence of the school.

A Course in Morals

The State Normal School at Greeley, Colorado, announces a course in moral education to be offered to Junior and Senior students in that institution. The course as announced emphasizes the rights and value of morals and the importance of personal hygiene.

The Montessori Method

The *New York Globe and Commercial Advertiser* of August 16 contains long interviews with Dr. Kilpatrick, Dr. Hillegas, and Miss Moore, members of the Committee of Teachers College who visited Rome to inspect the Montessori schools. The general tone of these interviews is in agreement with the following statement quoted directly from one:

"Mme. Montessori has really not contributed any thoughts essentially new to education. She has rediscovered or revived some educational doctrines which were known over a hundred years ago, and some of which were rejected by advanced American educators about thirty years ago. Mme. Montessori no doubt was sincere in her work, and she still is convinced that she has invented a new system of education. It is probably true that she worked out her method quite independently and that she did not know that her doctrines had already been proclaimed by educators years ago."

There is always danger of misjudging systems of education either because of overenthusiasm or overconservatism. It is to be hoped that the observations which lie back of these interviews may be put into form which will help American teachers who have not been in the schools of Rome to form just opinions on these new methods which have been so widely discussed.

MONTESSORI AND FROEBELIAN MATERIALS AND METHODS

LUELLA A. PALMER

This article is written merely to start a discussion with regard to the possible combination of Montessori and Froebelian materials and methods as suggested by Dr. Holmes in his introduction to Dr. Montessori's book. No definite conclusions can be reached yet, for several reasons: (1) Mme. Montessori herself feels that her system is not thoroughly worked out; (2) there are few schools even among those called by her name which have accepted the most fundamental principle of the Dottoressa's teaching, the right of the child to liberty; (3) it takes the sifting of time and the judgment of many minds to discover the truly permanent in any system.

It is not necessary to describe in detail the Montessori materials. Those interested in the new method have read either Dr. Montessori's book or the articles which give accurate descriptions and which have appeared in various magazines. They fall naturally into three groups as indicated by Dr. Holmes: those for sense training, physical training, and social training. The sense materials are such as the frames for buttoning or hooking, and the insets, plane and solid; the materials for physical training are such as the stairway, swing, rope ladder; the social materials are those used in the home activities such as preparing and serving food, cleaning, and dressing.

We can easily believe that Froebel would be in hearty sympathy with the physical and social training as advocated by Mme. Montessori, but where in her system the physical education would merely make provision for the exercise of the muscles and through these influence the human side of the child, Froebel would see a more direct spiritual effect in the experience itself. Froebel would hold that the child feels an exhilaration in the act of swinging such as Stevenson has expressed in

How would you like to go up in a swing,
Up in the air so blue?
Oh, I do think it the pleasantest thing
Ever a child can do!

Up in the air and over the wall,
Till I can see so wide
Rivers and trees and cattle and all
Over the country side.

In the social education there would probably be the same difference. The Montessori training, by having the children do necessary things together, is fundamental but would lack the exercise of the imagination which would be given by the social game of Froebel. In the game the child would see in epitome the forms and results of social co-operation and so have these ideas brought to consciousness with much more distinctness. Muscle exercise is developing and lessons in serving our neighbors are ethical, but these can be given the highest significance by cultivating the imagination at the same time.

Let us confine the discussion to the question, Do the Montessori and Froebelian materials and method for sense and hand training have any relation to each other, are they equivalent, do they supplement each other or do they overlap?

The first Montessori materials, those for fastening cloth together, are not duplicated in any way by the Froebelian materials. They give a child an opportunity to repeat some of the operations which he sees carried on around him and which often relate to him very personally. For this reason he is much interested in them. By isolating these operations and giving them under conditions which make it possible for him to practice them and test whether he can do them properly, the first step is taken in the scientific study of the environment, which is by isolating and concentrating on particular problems. Attention is paid to material and its limitations, there is only one correct solution, there can be no intermediates between right and wrong in working out the problem. The very simplicity of having only two alternatives, but one of which is right, gives a little child a sense of security in solving the problem and of mastery when the definite, easily seen end is accomplished.

In all probability when a child uses this material it will not be the first time that he has studied his environment in this way, isolating certain actions and testing control; but Montessori has devised the simplest educational material which can be supplied for such study. (Little children will often for ten minutes at a time open and shut a drawer or drop and pick up a stone.)

The insets of different kinds isolate certain facts of the environment as to form and size. These materials, also, are so planned that there is but one correct solution to the problem presented. The child feels that there is some definite relation between the removable objects and the openings. Unless he finds out the right relation and puts each object in its proper place, he will be left with something that does not "fit." After several attempts a child about three years of age finds this state of affairs unsatisfactory.

When the flat insets are used with the cards the child corrects his own error. If he has not succeeded in finding a form which will completely cover the filled form or the outline or line, he has no one to blame but himself, his observation has been at fault, the material always offers a perfect solution.

With the long and broad stairs and the tower there is but one right way to show a satisfactory relation between the objects presented. The material again isolates a definite thing to be learned in proportion. Although by combining the different parts of the long stair, number values in addition, subtraction, and multiplication can be seen, this is a use which is secondary to its original purpose and is far too difficult for the child who is only ready to distinguish the differences in proportion.

With the foregoing materials the child would probably stumble on a correct solution even if he had no teacher near him to offer suggestions. With the color tablets the different textures of cloth, and the rough and smooth tracing, the teacher must take the initiative by supplying words to accompany the discrimination. She must also be at hand to show the next step when the child is ready to proceed. The eye and fingers soon become sensitive to differences in shade and texture but there is always a possibility of mistake which can be determined only by social approval or the reverse.

All of the above Montessori materials have tested sense discrimination, they have been sense gymnastics, they have called for observation and eye and muscle identification. They have given the child skill in controlling certain activities of his body, and the pleasure obtained has been from the accuracy with which he has been able to learn from matter and conform to its laws.

If we turn to the Froebelian materials we find that they can be used somewhat as those of Mme. Montessori but that a new element enters in which brings a different educational advantage.

The six prismatic balls can be used for sense discrimination, but while the Montessori color tablets have suggested by their form that they be laid upon the table, the balls suggest motion. As soon as motion is involved there comes a possibility of choice. The roundness says to the child, "grasp," "roll," "toss," "bounce," the string says, "swing," "drag," "twirl." So, although the material limits the child, there is so much latitude within these limitations that the child feels free. Instead of learning but one thing from his material, he learns several and experiments with his knowledge and exercises his human prerogative of choice in using material in several possible ways according to his own desire.

Just as soon as motion, choice, freedom, enter in, the material becomes food for the imagination. Stability points toward unchangeable law, choice in movement points toward infinite possible variations. The imagination is set free. Whereas with the flat object there has been only the desire to find a similar color, now, with the moving object, there is desire to find something similar in motion. So we have a "wheel," a "bird," a "pussy," and the many other ideas which flit through children's minds, and they are many, for moving objects attract a child's attention.

The three objects of Froebel's second gift, the wooden ball, cube, and cylinder, invite to a comparison in form and also to a comparison in motion. With these objects the errors in motion correct themselves, the cube will do but one thing, stand still; the ball will do but one thing, roll; the cylinder will do either. After learning the possibilities of the material a child must have in mind some definite thing which he wishes to do in order to confirm his knowledge or find his error. He must make a choice in

thought and then test his knowledge of material by his ability to carry out his idea. In the Montessori tower and stair the material has always said, "Do one thing." With Froebel's second gift the material says, "What will you do?" and then the child tests whether his idea is in accord with the idea in the material. Mme. Montessori thinks that children "rarely recognize solid geometric form."[1] According to her the ball, cube, and cylinder would not be as useful for little children in promoting the observation of form in the external world as plane figures. If this is granted, it means that these objects cannot be used as Montessori uses her form material but that they can be used in the distinctive way in which Froebel's material has the advantage, as types of motion. It is interesting to note that in play children almost invariably prefer the ball or cylinder to the more stable cube.

With Froebel's building-materials there are many variations which can be worked out. If one cube of the third gift (a cube divided into eight small cubes) is taken, there are many possible ways of placing another cube in relation to it, back, front, right, left, or on top, corner to corner or corner to face. The test is whether the resulting form embodies the child's idea as nearly as he can express it with the material at his command. The observation demanded is not only of the material itself but of form in the outside world. As the building-gifts progress, more and more possible variations present themselves until a child is able to represent quite complex objects. After he has used blocks of varying shapes, a child will be able to test his knowledge of the material by having the choice presented to him of which material will best carry out the idea which he wishes to represent.

The tablets (wooden circles, squares, triangles) and rings are in shape much like the insets and outlines of the Montessori materials. They invite to discrimination in form, but besides this they leave the child free to make arrangement in many different ways. Montessori feels that the geometrical analysis suggested by Froebel is too hard for little children except as called for in application to everyday living.[2] She thinks that each form should be

[1] Maria Montessori, *The Montessori Method*, p. 238.

[2] *Ibid.*, p. 243.

observed as a whole rather than as made up of parts.[1] To consider it in the latter way would be to deal with abstractions when the child is able to understand only the concrete.

Sticks and seeds like the other Froebelian materials are capable of being used in two ways, to show the limits of straight lines and points and also to show that by combination and arrangement they can be adapted to expressing an idea which the child has in mind.

In the "occupations" of Froebel (the materials which cannot be returned to their original form after the child has used them) there are many ways of varying the results. Paper, crayon, clay give many possibilities both in the discoveries about the material itself to which they lead and in the expression of ideas to which they lend themselves. Weaving and card sewing are more like the Montessori materials in that the choice is very restricted; the expression is limited to ideas about the material itself; imagination, interpretation cannot enter in. Both of these occupations are considered by Mme. Montessori too severe a strain on the eyes of little children.[2] Folding is considered by her "hand gymnastics"; she does not feel the value of the imaginative use of the objects made. Clay and drawing, which Froebel felt gave great opportunity for the creative use of the imagination and consequently an educative use, Mme. Montessori considers uneducative.[3] Yet she feels that they are necessary in order that the teacher may study the "psychic individuality" of the child and find out how much of the knowledge implicit in the regular lessons has been assimilated.[4]

It would seem as though the Montessori and Froebelian materials were not equivalent, that they were intended to supplement each other. One lays emphasis on a single property of matter at a time, the other offers several for discrimination and consideration. One draws attention to the inert properties of matter which pertain to lower forms of nature, the other includes motion and possible position, the attributes of higher types of life. Montessori emphasizes the more primitive attitude of the child as a learner

[1] *Op. cit.*, p. 236.
[2] *Ibid.*, p. 162.
[3] *Ibid.*
[4] *Ibid.*, p. 241.

from material, Froebel suggests experimenting and learning from material but also using it to carry out human ideas. A child must advance from the study of simple isolated ideas to those of more complexity as found in daily experience. Matter and motion are both in the scheme of the universe, both have discoverable laws and need to be understood to give complete control of the outer world. A child presents various tendencies at the same time. Both the scientific attitude and the interpretative are necessary for well-rounded living.

In the function of the teacher, Froebel and Montessori do not completely agree. This is because of their fundamental difference in philosophy, which is also at the basis of their divergence in materials and methods. Montessori feels that the teacher should be at hand, to help a child in his effort to realize the relation between concrete material and himself. Froebel felt that the teacher's place was, not only to supply didactic material which the child could manipulate, but also to arouse ideas so that the child would seek to embody them in material. With Montessori, the teacher appeals only through the material which she presents; with Froebel, she appeals through the material and also by presenting some idea which it would be possible to express by conforming to the laws in the material.

Both Montessori and Froebel impress the fact that the teacher should study each child individually, and should present materials in a progressive way when the child shows that he is ready for the next step. Where Montessori would leave the child alone to learn as the race has, Froebel might suggest an idea to follow which would hasten the process of learning. Montessori seems to see no middle course between letting entirely alone and a form of dictation.[1] As for instance after a child is taught "blue," she would have the teacher make no application so that some day the child will be able to discover with great joy that the sky is blue. The only alternate she sees to this is pointing to the sky and saying, "What color is that?" and then teaching "blue."[2]

[1] On p. 115 Montessori suggests the value of a *generalized* observation, given by the adult: "We experience the joy of having crystallized an impression which we had before only imperfectly felt."

[2] Montessori, *op. cit.*, p. 110.

Would the Froebelian course be to make the child's senses alert by suggesting after the lesson, that he might find something else blue? The joy of later discovery would probably be as great and be made in a shorter time.

There seems to be but one right method with the Montessori materials, that of letting the child learn the one lesson which was intended by its isolation. This is satisfying and educative for young children. It is like drawing single strokes. These may please little ones for a while but soon they want a result which calls for more knowledge and control.

As Froebelian materials suggest different kinds of knowledge to be gained from the material itself and also the manipulation of the material for the purpose of interpretation as well as control, so there might be various methods by which these materials could be made educative. In an article entitled, "Principles Underlying the Organization of Kindergarten Materials,"[1] I have suggested the following:

> When a child reaches kindergarten age, he is ready to use material in several different ways. (1) There is still much that he may learn by actual contact, many actions may still be impulsive responses to the qualities of the matter presented. (2) Many of the child's actions may be dictated by an adult or be imitations of copies set for him. (3) A child may be led to improve upon some form which he made while experimenting with the material. (4) Some idea may be stimulated, which in order to be complete must, through the expending of the full amount of effort, arrive at a goal. This method may be called either the suggestive or purposive; if viewed from the teacher's side, it is suggestive, from the child's it is purposive. It is founded upon the principles which Froebel realized as most educative because they organize experience.
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> A very simple illustration of the above methods may be given in the use of the divided cubes of the fifth gift. (1) A child might be left free to discover the possible uses of the half-cubes, for instance, for a slanting roof. (2) Some form with such a roof might be dictated or be imitated. (3) Some form that a child had accidentally made, might be repeated with suggested improvements. (4) A different kind of material might be used as a stimulus, such as a picture of a barn, in order to arouse the desire to make such a form, and the blocks then placed in the child's hands. A double stimulus would be applied through picture material and block material. The child would have a more or less

[1] Paper presented for discussion at the Training Teachers Session of the International Kindergarten Union, 1911.

definite idea to express, would put forth effort in trying to accomplish it satisfactorily, would control means to bring about the end which he feels of value, and would discover the possibilities of the material itself. The more developed children can be led to understand why man uses the sloping roofs, and for them the stimulus provided might have been in the form of a little problem, how to make a roof which would shed rain. Sometimes the older children may have an idea so clearly in mind that they can make a choice of the familiar material which they think would be best adapted to carry it out.

These different methods represent the different uses which man has made of his environment in gaining control over it. Each has some value in developing the right attitude toward the surroundings. None should be omitted in the kindergarten, none used exclusively. (1) If experiment is never allowed in the use of materials the children will not learn how to investigate, they will be helpless when confronted with any new problem, they will never advance beyond their companions but will lose the exquisite joy of discovery and contribute nothing to the knowledge of their own world. If no other method were used there would be only slow progress. A tendency would be formed to be governed by the moment's interest and not to sum up or connect. Respect might be lost for material, and effort would lie dormant if no product could be conceived better than the one chanced upon. (2) If a child never imitated a good copy or followed a dictation he would miss some of the uses of the material which he was capable of appreciating, but not discovering for himself. If this method were used exclusively, it would develop a habit of following blindly and the idea of taking the initiative would never be formed. (3) Where there is no repetition for the sake of improvement, there is a tendency to be satisfied with results that have not demanded a child's best effort, many things are attempted but nothing done well. A child can measure himself and gain fresh impetus for further effort when he sees two similar products placed side by side, one the result of today's work and the other of last week's. If this is the only method employed, the child uses each material for itself, never in relation to any other. It gives him a disconnected view of his environment, he will not feel the unity of thought underlying its various expressions in material. (4) If the purposive method is never used, the materials will never be organized upon the highest basis. A desirable end in view demands a child's best effort, right stimulation will not only call forth self activity to conceive that end, but also require that in its accomplishment control shall be gained over the particular material used and its relation shown to other materials through thought. If this method should be used exclusively, it would defeat its own object, the children would become discouraged and effort paralyzed because they would be tasked to arrive at a result before they could control the means through which to attain it.

The period between four and six years is the time when there is a decided change in the character of the purpose for which materials are used. At four, the gratification of the passing moment is all that is sought; at six, the result

and simple means by which it is attained are much enjoyed. These facts should in a general way decide the kind of method predominant at the beginning of the kindergarten and that at its close. It should be mainly experimental at the beginning and purposive toward the end.

The Montessori method with materials is (1), the first of those suggested above, that of learning by actual contact. The methods for Froebelian materials may be many, as stated above, progressing in harmony with the material.

"Method" is larger than the mere using of sense materials; it includes all the means by which the ultimate goal is to be reached as well as the goal itself. The ultimate aims in education of Montessori and Froebel appear to be nearer alike than the roads by which they would reach them. Compare the two following quotations.

> The mother [in instructing Lena how to read] now resembles here in her action the sun, which in spring awakens the slumbering power in seeds and buds, which slowly rousing, further nourishes and strengthens itself. And so it is to be with all human education.[1]
>
> And such is our duty toward the child, to give a ray of light and to go on our way. . . . . To stimulate life—leaving it then free to develop, to unfold—herein lies the first task of the educator."[2]

We can imagine Montessori writing in simpler words:

> We are repeatedly impressed with the conviction that everything which is to be done for the true human development of the child, and all efforts which are to be made for such an education as will satisfy the needs of all sides of its being, must be connected with, and proceed from, the fostering of the impulse to employment, and the oversight of the first employment of the child.[3]

For Montessori the employment would signify "work," for Froebel it would involve a freer element "play." He felt that earnest play held the same values for a child as work does for the adult.

This employment for Mme. Montessori is to aim at the development of the will-power. "The method which is the subject of this book contains in every part an exercise for the will-power, when the child completes co-ordinated actions directed toward a given end, when he repeats patiently his exercises, he is training his positive

[1] Froebel, *Education by Development*, p. 15.

[2] Montessori, *op. cit.*, p. 115.

[3] Froebel, *Pedagogics of the Kindergarten*, p. 24.

will-power."[1] For Froebel the will-power is more a means than an end. "It is the conquering . . . . of the outward hindrance of life by one's own will-power and one's own enhanced power of action, which preserves to man peace, joy, and freedom in his own consciousness, and thus elevates him to that likeness to God for which he was destined."[2]

The desired result, the harmony between child and environment are expressed by Froebel thus: "One willingly makes oneself at home where one can act freely; and on the other hand, one can act freely where one has made oneself at home."[3] In the Montessori schools where Mme. Montessori's principles are thoroughly understood and carried out, a result is seen similar to the above description in actual practice; the children are free and self-controlled. Surely these schools are approximating Froebel's dream of "an institution for self-instruction, self-education, and self-cultivation of mankind."[4] The principal difference is shown in his next sentence: "Individual cultivation of the same through *play*, creative self-activity, and spontaneous self-instruction."[5] The idea of play, of cultivation of the imagination, which Froebel gives as the first means, is that activity of the human mind which has resulted in works of art, in painting, music, and literature. It is this cultural side which seems to be lacking in the Montessori schools and upon which Froebel lays so much stress.

Mme. Montessori is restricted in materials and methods with materials, but she is free in actual practice because she feels so intensely the individual's right to follow his own life. Froebel's materials and possible methods are freer, but when he described his practice he became more circumscribed. Froebel's discovery of the educational value of simple sense materials was so startling that he had to impress the fact upon his contemporaries. When he planned lessons for little children he was so anxious for adults as well as children to find the knowledge that he knew was implicit in the materials, that he sometimes forgot just how the little child ought to approach them and so he dictated uses which would have

[1] Montessori, *op. cit.*, p. 364.

[2] Froebel, *Pedagogics of the Kindergarten*, p. 26.

[3] *Ibid.*, p. 27. [4] *Ibid.*, p. 6. [5] *Ibid.*

been more educative if the child had discovered them for himself. Constant obedience to the word of an individual is slavish, but following the suggestion of a self-determined end sets free. Montessori with the calm patience born of waiting for the slow development of defective children is willing to let a child discover knowledge in order that he may gain something better, the *habit* of acquiring knowledge, the attitude of mind involved in "attention, comparison, and judgment."[1]

The foregoing discussion has tried to suggest the feasibility of combining the different materials and methods into one system for the education of little children. There must be an elimination of some of the materials in order that the child may gain sufficient control over others to make their use valuable. Choice might be based upon the degree to which the materials carry out the characteristic aims of the two educators, the discovery and control of the properties of matter, and the interpretation through material. This is a question which admits of much debate. Perhaps the following might be discarded for children between three and six years of age: (1) Intricate forms of plane insets, many of the "stuffs" and shades and tints; these might be used later and in place of them at this age the child might study the more variable and complex properties of matter as shown in Froebelian material. (2) The Froebelian tablets and rings; these are meager in interpretative possibilities, and the properties of plane surfaces as well as number and proportion can be studied better through the Montessori material. (3) Weaving and card sewing can be postponed until a later period, not only because the eye and hand will then be stronger, but because they are not good as material for interpretation. They might be employed as advance steps of the Montessori material and method.

With the use of Froebelian methods should be kept in mind the great principle which makes the Montessori children so free. The object to be accomplished is never just the will of the teacher, there is always a third something in control, where it does not mean conforming to the limits which the material itself sets, it should be an end realized by the individual child, a task which

[1] Montessori, *op. cit.*, p. 360.

he sets himself. "Once the habit of work is formed, we must supervise it with scrupulous accuracy, graduating the exercises as experience has taught us. In our effort to establish discipline, we must rigorously apply the principles of the method. It is not to be obtained by words; no man learns self-discipline through hearing another man speak. The phenomenon of discipline needs as preparation a series of *complete actions* such as are presupposed in the genuine application of a really educative method. The end is obtained by developing activity in spontaneous work."[1] The truly educative method is to have the child realize the immediate goal toward which he is working and which he has selected or helped to select, to let him make a choice of means by which he will arrive there, and then *to control himself* enough to accomplish this end. This gives training in self-discipline.

If this principle is accepted in the use of Froebelian material it will do away with much uniformity in results. As the material is variable and designedly so, each individual may carry out the same idea in a different way. The uniformity heretofore required has been on the supposition that the result obtained—the object seen—was the thing of value to the child; this is not true as Montessori shows in her illustration of the child filling his pail with gravel.[2] It was the act of filling, not the full pail which was of value to the child. It is the way in which a result is obtained which determines whether it is educative, it must be attained by self-impulsion toward some self-determined end.[3]

Although the result of accomplishing diverse things with the same material, is exactly contrary to that achieved by the use of Montessori materials, which by their very nature require uniformity, the use of the same method will produce this opposite effect because of the variable nature of the kindergarten material. It is this method founded upon the principle of "spontaneous activity" which Montessori insists makes for self-discipline.

Mme. Montessori sees self-development coming through the conquest of self-determined ends. In order that the child may

[1] Montessori, *op. cit.*, p. 350. [2] *Ibid.*, p. 355.

[3] Dr. Dewey says: "It is better to get an externally efficient *method* of getting a result than the mechanical result. It is better to fail intelligently than to succeed accidentally."

gain the habit of striving toward an end and accomplishing what he set out to do, she supplies material which will lead to gradually more difficult attainments. It is the very simplicity of her first materials which make them so educative for little children; they provide an easily attainable goal but one which represents a completed action. Of the separate actions leading to the game of silence Montessori says: "These actions being directed toward an end have no longer the appearance of disorder, but of work. This is discipline which represents an end to be attained by means of a number of conquests. The child disciplined in this way is no longer the child he was at first, who knows how to be good passively; but he is an individual who has made himself better—who has made a great step forward, who has conquered his future in his present."[1] "He is learning how to become his own master."[2]

It must be remembered that "master" for Montessori means almost wholly one who controls himself in order to conform to some established standard; the emphasis is on stability. This is excellent training for little children especially in this age of nervous frenzy in invention and quick change of custom, but there should also be education which prepares for the freer aspect of life. It is this emphasis on stability which gives the children in the Montessori schools their characteristic poise and freedom. With more emphasis on the changeable side of living, the children would not appear so self-controlled but might be better prepared for progress in life.

Whatever the limitations that are felt in the Montessori philosophy, material, and method, there can be but one judgment with regard to the purpose of method as expressed thus: "The greatest triumph of our educational method should always be this: to bring about the spontaneous progress of the child."[3]

As stated in the beginning, this article is only intended to provoke discussion. The Montessori idea of respecting the individual development and needs of each child appeals very strongly to kindergartners. As they long to give little children the best opportunities for self-cultivation which can be obtained, they try to be neither hasty in giving up the good in the old theory and practice, nor slow in accepting what is of value in the new.

[1] Montessori, *op. cit.*, p. 352. [2] *Ibid.*, p. 366. [3] *Ibid.*, p. 228.

THE NEED, PURPOSE, AND POSSIBILITIES OF INDUSTRIAL EDUCATION IN THE ELEMENTARY SCHOOL[1]

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The time at my disposal is brief and the subject of industrial education is a large one; therefore I desire to define the specific phases of it about which I am to speak. The discussion will be limited first of all, obviously, by the terms used in the title of the paper, "industrial education" and "the elementary school," and those must be examined briefly.

Industrial education still means different things to different people. As used in this discussion it will mean a complete and adequate scheme of education for the future industrial worker. This scheme includes not only the industrial work but all the related mathematics, science, and art appropriate to the grade of practical work undertaken, and the necessary English, civics, and hygiene.

Many industrial workers will receive training in continuation schools, in trade schools, in high schools, and even in higher technical institutions, but these, for the time being, are not under consideration. The title limits our discussion to the *elementary* schools.

What the elementary school is, and what it ought to be, cannot be disposed of in a single sentence. This unit in our school system has not always been called "elementary," but the names "grammar" and "common" were formerly used and are still heard occasionally. A generation ago the expression "a common school education" meant the training given to that large majority of school children who never had any intention of going to a "high" school. It was superimposed upon the "primary" school of

[1] Read at the annual meeting of the Western Drawing and Manual Training Association, Cincinnati, Ohio, May 3, 1912.

three grades and, together with the primary school, comprised a nine-year course. There still remain school systems with nine elementary grades.

These schools were, in a measure, finishing schools. They were supposed to give the fundamentals of a general education—to provide the pupils with the common tools of an English education. That these schools were efficient, for their time, is only too clearly shown by the countless number of men and women who have attained eminent success in later life with only this training as an educational foundation. No one thought of criticizing the common or grammar school because only a small percentage of its graduates went to the high school. Preparation for high school was not the primary purpose of such schools. What the purpose was may be stated in the words of John Stuart Mill found in his inaugural address at the University of St. Andrews in 1867: "Education makes a man a more intelligent shoemaker, if that be his occupation, but not by teaching him how to make shoes; it does so by the mental exercise it gives and the habits it impresses." At that time there was little doubt that somewhere the boy would be taught to be a shoemaker, a machinist, a salesman, a bookkeeper, or what not, but it was believed that he would be more intelligent, both in his business and outside of it, because of the sharpening and the habitual drill which he was to receive in the school.

It has remained practically for our own day to decree that the main function of the elementary school shall be to select those children who are qualified to continue their education in the high school and to *prepare* them to do so. Without further exposition of facts let me state my main contention in this matter and say that, if the primary purpose of the elementary school is to lay the foundation for a secondary education, and to select those who are competent to take that work with value to themselves, then the elementary school consumes too many of the precious years before the fourteenth birthday of the pupil in giving this preparation, and it imposes tests which make it impossible for many pupils to reach high school at all. Among the rejected is some of the best material in the schools.

When it becomes an established fact that the purpose of the elementary school is the laying of this foundation and the selecting of the pupils best suited for the diversified work in high schools; when there are but six elementary grades, and when the methods employed in these grades are encouraging, instead of repressive, to the concrete-minded children, then there will be no need whatsoever for industrial education in the elementary school. Until that time shall come, I maintain that the most important part of industrial education must be given in connection with the work of grades 7 and 8 of our present elementary school.

In passing it may be noted that, in 1910, the New York State Education Department recommended a six-year elementary school, and also that, for the past two years, two school systems, one on the Atlantic and the other on the Pacific coast, have been administering a six-year elementary school, with a lower and an upper high school. In this lower high school, work such as we are now advocating for the upper grades of the traditional elementary school is made possible.

It will thus be seen that the present organization of our school systems into elementary and high schools of eight and four years respectively, and the consequent domination of the higher over the lower constitutes one of the greatest "needs" for industrial education in the elementary school.

I will present now for your consideration, a few other reasons why industrial education is needed in these schools *as they now exist*. I shall endeavor to state these reasons without argument, merely desiring to bring the several questions forward for discussion as concisely as is consistent with an adequate understanding of their import. The statements follow.

Perhaps the least important reason which I have to suggest is that the wages of some children, even at the early age of fourteen years, are needed for the support of some dependent. I believe that there are relatively few such cases, but there must be some children so situated. The least that the school can do for them is to make them so efficient that their childish service may be worth more than untrained, irresponsible, child labor. Experience has demonstrated this to be possible.

The second reason is closely related to the first, but applies to a much larger percentage of our children. In common with the world in general, industry today demands specialists, or at least requires specialized training for its successful workers. This specialized training is being furnished more and more by secondary schools and the higher institutions of learning. More subjects have been added to the curricula of secondary and higher schools since the Civil War than had been offered in all school courses prior to that time, and these subjects have been introduced largely in the interests of vocational education. Since the elementary school fails to deliver 75 per cent of its children to the higher schools where these vocational subjects are taught, but allows them to go, entirely unprepared, into their life-work, there is a need for something of vocational content in the grades to help this 75 per cent in their competitive struggle with the more fortunate 25 per cent.

Again, the industrial development of the country requires in the industrial workers, the vast majority of whom receive their only school training in the elementary grades, a much higher degree of industrial intelligence, and a keener industrial interest or curiosity than can possibly be awakened or created in the low-grade industrial occupations themselves. The child who, as Dr. Felix Adler says, has been "pitchforked into industry" at an early age, is too near the great unintelligible organization to see it as it really is. The perspective is distorted, and even the good things about it, the necessary economies and the efficient management, seem altogether selfish, heartless, cruel, and inhuman to the young worker. He sees only the grinding wheels which seem to have caught him in their ceaseless whirling, and he feels as lacking in intelligence as they, and as hopeless of an opportunity to perform any other function in the complex process. Beyond a doubt something of this marvelous organization might be demonstrated to those children by the proper kind of work given in connection with their studies at, or preferably before, the time when they will undoubtedly leave school. This whole matter can be so explained and illustrated that children will be a little more discriminating in their selection of jobs, and also a little better able

to see the necessity for rigid regulations and apparent severities. Such knowledge would enable them so to adjust themselves to the burden, that they can carry it more easily and more hopefully, and with a reasonable certainty that faithful and intelligent work will bring reward here as elsewhere. No one has time to teach them all this after they have entered a mill or factory. Certainly if they are to make their entry into industry through the mill door, it is of more vital importance that they learn something in school of the methods and meaning of modern industry than that they acquire proficiency in figuring bank discount and partial payments, or in computing interest on promissory notes or in distinguishing between a participle and an infinitive. Therefore there is need, in some communities, of a certain type of industrial education because it will *deter* children from entering low-grade industrial occupations, or will lead them to defer such entry as long as possible, and because it will enable some to rise through such work, instead of being crushed by it, provided they must enter it eventually.

There are four other reasons which may be urged—reasons relating to supposed defects in our traditional educational ideals and practices. The first of these is that this type of education is needed, for boys especially, because it brings more men teachers into the schools. Without overlooking the fact that women are generally better teachers than men, it is nevertheless to be regretted that the majority of boys leave school without having come into contact with a male teacher, except for matters of discipline. Furthermore, the men thus brought into the schools will be of a somewhat different mental attitude and fiber and should serve to hold the balance true and to give a more practical flavor to education.

It has been said, and it is probably true, that our traditional school system tends to create a disinclination to hard work of any kind but especially to manual work, even when such work requires a high order of thinking and promises ample financial and social reward. Referring to the work of Pestalozzi, in his *Educational Reformers*, Quick says, "To many people in the present day it might seem that education, when quite successful, would

qualify *laborers* to become *clerks*. This was not the notion of Pestalozzi." It has been noted by all writers on child-study that the child loves activity of almost any sort. It is noticed that children like to *play* at work, but it is also to be observed that children enjoy real work when done in company with their elders. Perhaps they do not care to be set about some uninteresting and disagreeable job, which their elders are also anxious to avoid, but, given companionship in their task, children generally *like to work*. It is a fundamental need in our education that the schools shall address themselves to the problem of so guiding and stimulating this interest in work that it will not have disappeared entirely in the child of seventeen or eighteen years of age. To utilize this almost instinctive desire of children, at the time it appears, training in real work becomes necessary in the grades.

Another distinctly educational reason for urging industrial work in the grades is that it is here that most children reach the period of early adolescence. It seems to be true that our present system of education makes little provision for this mysterious and difficult period of the pupil's school life. If there is any one thing true about the period it is that, during it, the peculiar tastes and desires of the *individual* must be carefully studied, and must be utilized as a motive power if the best results are to be achieved. This period brings to thousands of our children the awakening of vocational interests, the more so when they are hungry and poorly clothed and are without spending money or the means of getting it. These vocational interests must, therefore, be brought into the school work and there utilized as an incentive for vigorous effort on the part of the child. Since with so many of our city children this vocational motive is derived directly from the low-grade industrial occupations above mentioned, the introduction of industrial education would seem to be a necessary educational measure.

And then this introduction of real industrial work into the elementary school is necessary because the first and most important function of the school should be to teach children to *succeed*. Our present schools too often allow children to remain in them for years (often until the children desert the school altogether and

forever), without ever experiencing the *joy of success*. After all, is there anything better that the school can do in eight years than to see that children form the habit of successful effort? For my part I would rather a child would *succeed* in industrial work than to acquire the habit of *failing* in his arithmetic, geography, and language work, and of accepting the situation with entire equanimity and indifference. It is undoubtedly true that large numbers of our children will succeed mainly, at this time in their lives, with concrete, creative work of a thoroughly practical and utilitarian nature. Therefore industrial education is needed in the elementary school for the purpose of showing some children how to succeed, and thus inciting them, through the joy of achievement, to still further accomplishment in this and in other fields.

There remain on my list of needs three others, more or less closely related to those already discussed, but having in mind chiefly the benefit which will accrue to society at large, rather than to the individual child or to the school system.

First I would note the advance which is being made by the National Child Labor Committee and other child-saving agencies in securing and enforcing school attendance laws and other measures regulating or preventing child labor. We must all recognize the desirability of such progress, but it raises, nevertheless, a serious question. No generation of men has yet been raised without the advantages, whatever they may be, that inhere in the intimate, personal, and early acquaintance with the difficulties and the joys of real productive labor. Whether this early acquaintance with real work and responsibility provides an *indispensable* element in the education of the race cannot be proven in a generation, but there is a growing belief that such is indeed the case. If one holds to that theory there appears to be but one solution of the problem, namely, to introduce industrial education into the grades as a substitute for child labor.

Industrial education is needed in the elementary schools as a preventive of juvenile delinquency. Existing industrial conditions render it difficult, if not impossible, for children of fourteen or fifteen years of age to satisfy their natural desire to earn money. Even if they leave school and go to work, investigation shows that

employment is extremely irregular and poorly paid. Such labor is often uninteresting, and so fails to hold the attention of the child, or to develop in him any enthusiasm for the work. The result is a great deal of idleness which is undoubtedly conducive to delinquency.

It is said that 95 per cent of boy delinquents have committed crimes against property. Most of these crimes would not be committed if money were plenty or even adequate to the barest needs of the family. It seems to be a fact that delinquency is on the increase, both in Europe and America. It would further appear that work of a distinctly vocational nature and promising the development of greater earning power would retain large numbers of the fourteen- and fifteen-year-old children in school, especially if the work were begun a year or two before the end of the compulsory school period.

However this may be, it is thoroughly well understood that the methods employed in the reformation of these delinquents, in reform schools and in penitentiaries, include a liberal amount of training in the practical arts and industries and in continual opportunity for the doing of work needed to maintain the daily life of the institution. A careful study of these schools, and of other schools for the unfortunate or less fortunate of our children, seems to prove beyond peradventure, the efficiency of these methods. They are employed, in many of these institutions, in training children of the same age and possessing the same general characteristics as the less progressive members of our elementary schools, and this fact leads to the belief that the same or similar methods applied in our public schools would be preventive and thus render less and less necessary our reformatory institutions. If this be true, industrial education is badly needed in our elementary schools.

And finally, I would urge as the last of the three social reasons and the last on my list this, that industrial education is needed to bring to our young people a finer appreciation of the joy and pleasure to be derived from productive work. This is needed as a corrective for the present tendency of our schools, in common with our civilization in general, to over-emphasize the pleasures to be gained by consumption and by passive entertainment.

The schools teach our young people, and rightly so, to desire and to enjoy poetry, music, art, travel, the drama, beautiful clothes, beautiful houses, both as to architecture and in interior furnishings, and many other things of like nature. The schools develop a strong desire to enjoy such things but give very little idea of how these wants can be satisfied, leaving the inevitable conclusion that money is the one and almost the only source of enjoyment. It should not be hard to convince a body composed of teachers of the manual arts that, while all the above-mentioned means of securing enjoyment are good, there has been omitted one which really brings a more lasting joy and one which may be, perhaps *must* be, combined with the love of the beautiful, and that is the joy which is found *in the making*. Children may be taught the joy *in making* for the better employment of their leisure, as well as the sterner joy *in productive labor* which will enable them to get a little more satisfaction out of their daily work. This interest, like so many other vital interests, is peculiarly susceptible of development in the child of twelve to sixteen years of age, and therefore should be the peculiar care of the elementary school.

If we turn from the consideration of the needs for industrial training in the grades to ask what the purpose of such training is we may feel that, obviously, the purpose is simply to meet the demonstrated needs and that nothing more need be said. I believe, however, that it is worth while making one general and inclusive statement regarding the purpose of elementary industrial education in addition to all which has been said in, or may be implied from, the foregoing. There are certain types of industrial schools which have a single, definite purpose, and rightly so; but any industrial work in the grades must be distinguished by a double purpose or it will be unworthy of our approval.

Industrial education in the grades must meet, in some measure, one or all of the needs which we have discussed. It must show the joy in productive labor, must serve to interest children in the industrial world, must enable the young worker to enter an occupation with some special training which will better prepare him to succeed in it, it must give him a respect for honest labor and teach him the satisfaction in work well done, it must give him

some comprehension of the great industrial organizations of our country and some notion of the dangers, difficulties, and possibilities of success which are presented by them; but this is only half the purpose. The other half consists in so presenting this industrial material that the children will be led, consciously or unconsciously, to a better understanding of what education is, of what the schools can do to promote it, of what advantages may come from a better mastery of the tools of knowledge, in short, so as to interest him in what we have commonly called "education" but which perhaps is better described by the more homely term "schooling."

This second purpose, perhaps the more important of the two, is an attempt to harness that great motive power, *the vocational interest,* in the service of stimulating elementary education as it is now employed in secondary and higher education. It is not to be doubted that some students pursue their college courses with the admonition of Solomon in their hearts, "Get wisdom, and with all thy getting get understanding," but I firmly believe that, if these courses were known to be devoid of vocational significance there would be an exodus from our institutions of learning, both of students and instructors. The vocational motive is potent with most of those who are receiving a liberal education, and it is the *purpose* of industrial education in the elementary school to provide an equally vital inducement to study for those children who can have but a few years of contact with the schools and who do not come at their life-work by way of the professions.

And finally, we are to consider the possibility of such work in the grades of the public schools. I shall be pleased to leave the details of these question for the discussion of those who follow me. I will say, however, that the best answer to the question that I can give is that, within three years, a dozen or more such classes or schools have been organized experimentally and have met with unexpected success. Merely to mention the location of these schools would show the widespread and growing interest in this work. Beginning at the Atlantic Ocean and ignoring the industrial schools which maintain a separate organization, that is, which require the children to leave the established pathway which leads to the high school and to the university, we find a line of these

elementary industrial schools under one name and another as far as to the Pacific. Within a few weeks, Boston, the city which first experimented with this type of school work, has fixed the status of the work by establishing seven "pre-vocational centers," so called. Fitchburg, Mass., Cleveland, Cincinnati, Indianapolis, Springfield, Ill., Evanston, St. Louis, St. Paul, Los Angeles, and Seattle have all *demonstrated* the possibility of industrial education in the elementary school.

Whatever may be the superiority of other types of industrial schools, it is certain that these will touch more pupils and at a time when to touch is strongly to impress. It is also true that whatever may be the relation of other industrial schools to the present school system and to the present corps of teachers, the elementary industrial work will be most effective when conducted under the direction of the manual-training authorities. This presents to the manual-training teachers of the country one of the most important and interesting educational problems now under consideration. It is my firm belief that manual-training teachers will rise to the occasion and will work out a solution of this problem which will be of great and lasting good to the entire school system.

THE RELIABILITY OF STANDARD SCORES IN ADDING ABILITY

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In[1] the effort to set up standard scores in arithmetic, or standards in any school subject for that matter, it is necessary to keep in mind the different purposes to which such scores may be put. Stone[2] measured school systems. Courtis[3] invites us "to measure the efficiency of the entire school, not the individual ability of the few." Others would doubtless urge "finding the individual." Perhaps the practical uses of scales or standards in the branches of the curriculum may be reduced to three. There is, first, the great desirability from the administrative point of view of determining the efficiency of instruction in groups, large and small. The purpose here is to learn of the effect of school conditions as exhibited in the achievements of classes, schools, and systems in comparison one with another. The idiosyncrasies of individuals are of concern only when they tend to differentiate a group from what is usual among school groups. There is, also, quite as important a need of standards in properly locating an individual child either as an entrant to a class or as a candidate for promotion. And standards are required for the purpose of disclosing the peculiar weaknesses which act as causes of backwardness in the more general abilities. It is plain that a standard score might be derived in such fashion as to serve one of these purposes without adequately satisfying the others.

The usefulness of standards for the analysis of pedagogical backwardness may not be obvious. Suppose that by the applica-

[1] The writers of the paper are under obligations to the following persons for considerate co-operation in the gathering of data: Superintendent Alexander Sheriffs, of San Jose, Cal.; Principals L. Bruch, A. L. Dornberger, V. Dornberger, J. E. Hancock, J. Manzer, R. A. Lee, of the same place; Principal M. L. Trace, of Hester; Dr. Margaret Shallenberger and Miss Henrietta Riebson, of the Normal Training School, San Jose.

[2] *Arithmetical Abilities and Some Factors Determining Them.* Columbia University.

[3] "Standard Scores in Arithmetic," *Elementary School Teacher*, November, 1911.

tion of a standard test in addition it appears that a certain child is seriously retarded in this general ability. It becomes necessary to discover just wherein his weakness consists before subjecting him to a course of corrective training. Our knowledge of the complexity of mental processes makes it likely that the factors conditioning even so simple an ability as adding are very numerous. Even a casual analysis shows four subsidiary processes that may, and in fact do, vary independently, weakness in any one of which may serve to pull the child below the average in adding. These are: the ability to make all the possible combinations of single digits with average rapidity and accuracy; the ability to hold securely in mind numbers of two- and three-place value while adding in the next digit or combination of digits in "running up" a column; the ability to "carry" from one column what is "over" to the column next on the left; and the ability to write down figures with average speed. The further analysis of these four constituent processes would doubtless lead into intricate psychological issues, which may or may not be required practically for the economical use of time in corrective treatment. But, in any case, it appears that before anything positive can be said of the weakness of the backward child in question, norms for each of these processes must be found. Once they are known, the performance of the child may be compared with them, and specially devised exercises may be employed to bring him up to standard at just those points, and those only, with which his backwardness in adding is associated. Practice in making the addition of single digits is not appropriate in a case where the difficulty consists in holding number meanings in mind. The processes may be as unlike as association and attention span. If improvement does not come from the use of the exercise selected, the situation calls for further analysis, one possible outcome being the discovery of fundamental defect. Norms or standards of performance are of course required for each factor distinguished.

AIMS OF THE PRESENT STUDY AND SUMMARY

From what has been said it is apparent that there are at least three kinds of pedagogical tests, which may be characterized severally, after their unlike functions, as administrative, grading,

and diagnostic tests. The first kind relates to groups, the last two relate to individuals. The third is comparable to the clinical test for mentality, except that it aims frankly at the analysis of specialized training rather than inherent capacity or "general intelligence." It may well happen, of course, that a given test may serve all three purposes, but it need not, and doubtless many tests will be devised for one of these purposes only.

This study took its departure from an attempt to use the Courtis "Standard Scores in Arithmetic" to measure arithmetical backwardness in a class of backward boys. These boys were at quite different points in their arithmetical training, and it was desired to grade them with reference to the average attainments of normal public-school children in order to estimate the time needed to bring them up with their classes. It was necessary, too, to locate their arrests and peculiarities as closely as might be so that their further training could be applied where it would do the most good. The Courtis tests, although used chiefly for the measurement of groups, are recommended for individuals, and several of them are of diagnostic value in the sense that they test abilities that are fairly elementary and at the same time highly important elements in the more inclusive abilities of which they are a part.

The Courtis scores were derived from a single performance from each individual. They are averages from the work of some nine thousand children in different parts of the country, and they may be taken as true measures of the average single performance in the processes they examine. Undoubtedly the average of single trials from large groups may be safely compared with them. But it seemed questionable, considering the possibility of accidental error from one performance, to measure individuals and small groups by means of them. It thus became necessary to consider the significance of one trial as an index to the standing of any individual in the abilities in question. The Courtis Test No. 1 on the addition combinations was chosen for examination.

This study, then, is an attempt to ascertain: first, the approximate reliability of a single score as a measure of an individual's status in the ability to make the addition combinations in writing; second, the number of scores required of an individual in order to

obtain a desirable degree of reliability; and third, the size of a group that may be measured with reasonable accuracy by means of one score from each member of the group.

With reference to the first aim it should be explained that by "unreliability" is meant the probable deviation of an actual single score from a hypothetical single score which would accurately place the individual on a scale of status. This hypothetical score was derived as follows. Twenty-five tests were given each individual, and the median, or the thirteenth highest score, was regarded as the measure of the individual's ability to write the addition combinations. It will be seen at once that if an individual began with a score of 55 combinations and attained a median of 75, his first score could not be said to be in error to the amount of 20 combinations, due to the fact that the median is uniformly higher than the first as a result of practice. It was therefore assumed that the middle measure of all the first scores of 202 children (51 combinations) would represent the same relative position on the scale of status as the middle measure of all the medians (70 combinations). The hypothetical first score was consequently considered to be for each individual fifty-one seventieths of his median. The deviation of the actual first score from the hypothetical first was then found in each case.

This deviation in the 202 cases examined varied from no combinations up to 26, with a middle measure of four combinations and an average of slightly over five. That is to say, any individual's score from one performance has one chance in two of deviating less than four combinations, and one chance in four of deviating ten or more, from that measure which would properly place him on a scale of status in this ability. This would seem to make one performance altogether too uncertain as a test of an individual's standing for purposes either of grading or of diagnosis.

In regard to the second purpose of the study it was found that safely to measure the ability of an eighth-grade child to write the addition combinations probably twenty-five trials are required. This number will practically assure a result correct within three combinations. If a smaller reliability will suffice for any purpose

the appropriate number of trials may be noted from the table given farther on.

As to the reliability of a single score from each member of a group for purposes of group measurement, on the average, measures of groups of 25 were in error approximately 1.7 combinations, groups of 50 were in error approximately 1.2 combinations, groups of 100 approximately 0.7 combination. This applies to eighth-grade groups.

PROCEDURE

Printed blanks for making the tests were prepared. The print and arrangement of the Courtis Test No. 1 were exactly duplicated for the first minute. This test consists of 120 combinations, including the hundred possible ones and twenty duplicates arranged in groups of five such that each five presented approximately the same difficulty as any other five. Four other slightly altered arrangements of the same test were made to occupy the remaining four of the five minutes devoted to adding on each of the five days.

Two hundred and seventy eighth-grade children in the eight larger grammar schools of San Jose, Cal., were given the tests. The desirability of having all the tests given by the same person—one of the writers—made it impossible to present them at the same time in all the schools. Each school was tested at about the same time on the succeeding days with insignificant exceptions. The one marked alteration of this order was with some fifty children in one school who were given the tests for the fifth day after a lapse of fourteen days. An examination of the returns from this group revealed a barely perceptible fall for which slight allowance was made. A formula was memorized and spoken to each class at the beginning, drawn in such a way as to insure a sympathetic and complete understanding of the test and a quick response to the signals. The children were encouraged to write as many combinations in the minute as they could without error, but emphasis was placed upon accuracy. Throughout incentive prevailed, as it seemed, from motives of individual and school rivalry and personal improvement. There was no evidence of fatigue. Time was taken by stop-watch. Close observation of the pupils showed that in a

few cases figures were improperly added on after the final signal but it is felt that the amount of this that was unnoticed by the examiners and uncorrected was really negligible. A rest of about thirty seconds occurred between each two trials.

From a preliminary study it had been concluded that five minutes' adding with rests of about half a minute avoided fatigue and preserved incentive satisfactorily. For various reasons twenty-five was chosen as the number of the tests from which a measure of status might be derived. This point on the practice curve was considered to be sufficiently far advanced practically to eliminate accidental error and yet not so far advanced as to involve learning ability unduly. Any number must be, perforce, the result both of some practice and of some accidental error. As to the effect of practice, it is evident no sharp line can be drawn between status and learning ability, in view of the fact that practice effects are marked after the first performance. It is merely a question of arbitrarily deciding upon the amount of practice which shall fairly be admitted in determining status. Surely children are entitled to the amount of improvement they can make in an hour's time, before being classified for a course of training of any considerable duration.

THE DATA

The number of combinations written each minute and the number of errors made were ascertained for each individual. The papers of twenty children who missed the fifth day were included. The decision as to how to deal with errors was made with difficulty. Courtis regards them as negligible in his test. The present writers supposed that such haste as would result in errors would at the same time increase the number of combinations written per minute, and various attempts were made to evaluate errors in terms of time, that is, to find the smaller number of combinations which might be assumed to have been written in the event that errors had not been made. It was then a matter of surprise to discover that scores containing many errors did not average as many combinations as scores without them, which seems to point to some third factor as being responsible for errors and smaller scores alike. For lack of a better term this factor may be called the "predisposition of the

moment." In any case, because of the smaller scores of the children making many errors and an observed erratic character of their performance, a somewhat complicated process of elimination was substituted.

The papers of any individual who made more than two errors in any one minute throughout the twenty-five were set aside, provided that in the event of not more than three errors appearing in one minute the results might be included when there were not more than five errors in one day and not more than ten in the five days. Some half-dozen children escaped on this provision. The papers of any individual who made more than five errors in any one day and more than fifteen in the five days were set aside without exception. No errors at all was thought to be too exacting, and inconsistent with our adult practice in which we work with moderate care and check for mistakes. The papers thus selected were considered to represent a reasonable degree of accuracy. The result of the selection was as follows:

	25 Tests (5 Days)	20 Tests (4 Days)	Total
Accepted	182	20	202
Rejected	65	3	68
Total	247	23	270

Figs. 1, 2, and 3 on the accompanying plate show the actual scores of three pupils selected to illustrate the possible variation among individuals. Of the twenty-five scores of each of the 202 individuals were found: the average of the first two scores, the average of the first three, four, five; the median of the first seven, of the first thirteen, nineteen, and the whole twenty-five, being respectively the fourth, seventh, tenth, and thirteenth highest. In the cases of the twenty pupils who took the test four days only, the twelfth highest was found to be the value which most nearly approximated the probable value of the median. These values for the three pupils represented in Figs. 1, 2, and 3 are shown as the longer lines in Figs. 1*a*, 2*a*, and 3*a*.

The median of the 202 first scores was found, also the median of

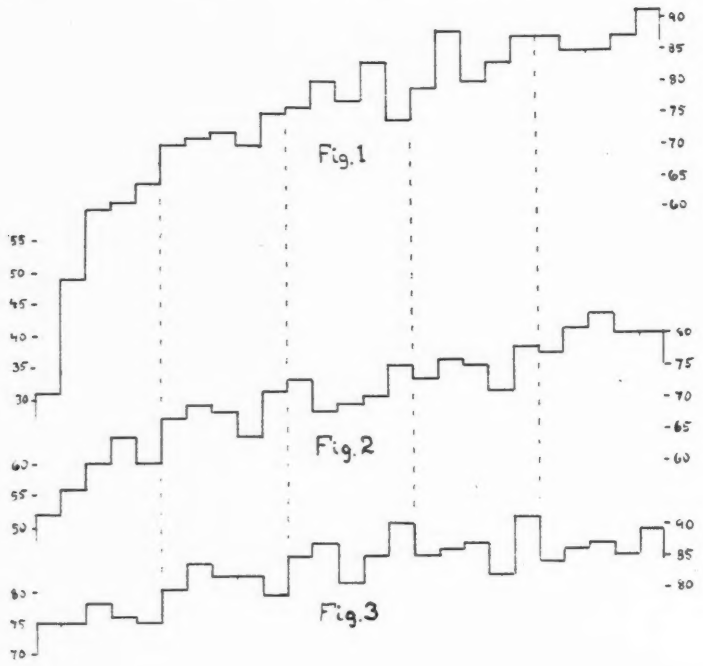


Fig. 1
Fig. 2
Fig. 3

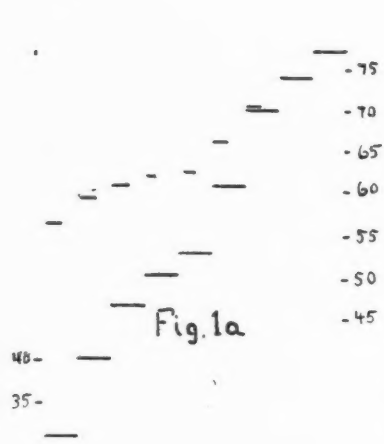


Fig. 1a

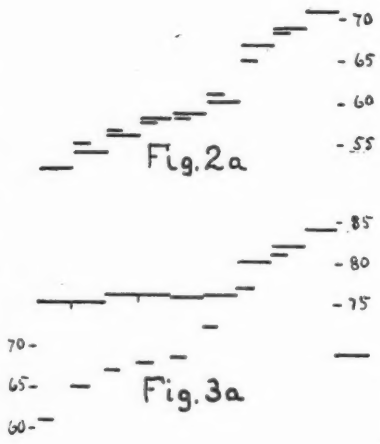


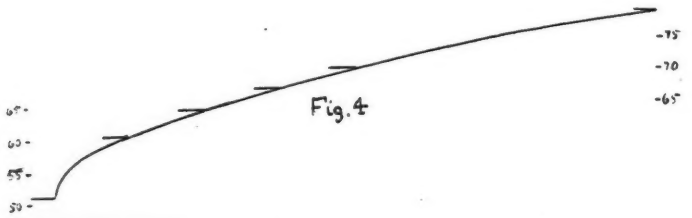
Fig. 2a

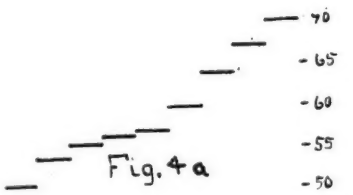
Fig. 3a

the averages of the first two, of the first three, and so on, for each of the above quantities. These are shown in the following table:

	Combinations
The median of the 202 first scores	51
The median of the 202 averages of the 1st and 2d scores	54
The median of the 202 averages of the 1st, 2d, and 3d scores	55½
The median of the 202 averages of the 1st, 2d, 3d, and 4th scores	56½
The median of the 202 averages of the 1st, 2d, 3d, 4th, and 5th scores	57
The median of the 202 medians of the first 7 scores	60
The median of the 202 medians of the first 13 scores	64
The median of the 202 medians of the first 19 scores	67
The median of the 202 medians of all 25 scores	70
The median of the 202 medians of the actual highest scores	79

The first scores varied from 28 to 88 combinations, the middle half falling between 42 and 60. The medians of the twenty-five scores in the 202 cases varied from 42 to 107 combinations, the middle half falling between 62 and 80. The quantities of the table are plotted on the plate (Fig. 4*a*). From these was constructed an idealized practice curve (Fig. 4) upon which appear six selected values.





Hypothetical first scores, or first scores which would locate each individual upon the scale of status in correct relation to every other individual, were computed, as explained previously, by taking fifty-one seventieths of each individual's median. Hypothetical values of the averages of the first two scores were computed by taking fifty-four seventieths

of the median in each case, and so on for the other values shown in the table above. These values for the three individuals represented in Figs. 1, 2, and 3 are shown as the shorter lines in Figs. 1*a*, 2*a*, and 3*a*.

Figs. 1*a*, 2*a*, and 3*a* may be interpreted thus: In the case of the first pupil, from some cause, the first score (the longer line) lacks 26 combinations of equaling that hypothetical first score (the shorter line) which would place him correctly on the scale of status. The average of the first two scores brings him within 19 combinations of the corresponding hypothetical value, the average of the first three scores within 14 combinations of its hypothetical value, and so on. The second pupil would vary but little in relative position by any number of measurements, so closely does his actual performance approximate the hypothetical. The case of the third pupil is quite the opposite of the first. Because of slight improvement the first score would rank this pupil far too high.

Out of 182 cases where all twenty-five tests were taken the first scores deviated from the hypothetical values by between zero and one combination in 26 cases, by between one and two combinations in 18 cases, in order as follows:

Combinations..	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Cases....	26	18	25	23	17	11	9	8	12	8	7	4	4	3	0	3	

Combinations..	17	18	19	20	21	22	23	24	25	26
Cases....	1	1	0	0	0	0	0	1	0	1

The percentage of deviation is not given. It would not augment the obtained degree of accuracy appreciably. The values of the

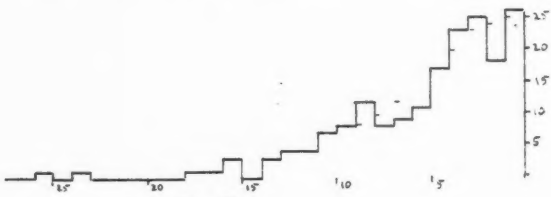


Fig. 5

table are plotted in Fig. 5 of the plate. Fifty per cent of the first scores were in error four or more combinations, 10 per cent were in

error 11 combinations, one score was in error 26 combinations. These and the amounts of error for the average of the first two scores, the first three, and so on, are shown in the following table.

Cases	50 Per cent	10 Per cent	One Case
First score	4 combinations	11 combinations	26 combinations
Average of 1st and 2d scores	3.5	9	25
Average of 1st, 2d, 3d	3	8	21
Average of 1st, 2d, 3d, 4th	2.85	7	20
Average of 1st, 2d, 3d, 4th, 5th	2.76	7	19
Median of first 7 scores	2.55	6	18
Median of first 13 scores	2.15	5	10
Median of first 19 scores	1.5	3	5
Median of first 25 scores	1 (probably)	2 (probably)	3 (probably)

The values in the 50 per cent column of the table are plotted in Fig. 6 of the plate where each value shows the median deviation of the value represented directly above in Fig. 4*a*. It appears that any individual eighth-grade child tested in the addition combinations by one trial stands one chance in ten of being displaced from his true standing by 11 combinations. From two trials the displacement would be nine combinations, and so on, as indicated in the 10 per cent column of the table.

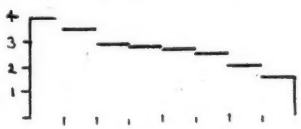


Fig. 6

The procedure for finding the reliability of group averages based upon one score from each member of the group was as follows. The averages of all the firsts and of all the medians in the 202 cases were found. They were respectively 51.5 and 69 combinations and form a ratio of 0.748. Two hundred of the individuals, chosen by chance, were distributed into eight groups of twenty-five. These groups were treated in the way individuals had been treated in the first part of the study. The averages of the first scores and of the medians of twenty-five scores were found for each group of twenty-five. Hypothetical averages of first scores were found by taking 0.748 of the actual averages of first scores. The average deviation of the hypothetical averages of first scores from the actual averages of first scores for the eight groups was approximately 1.7 combina-

tions. The two hundred individuals were then distributed into eight chance groups of fifty and eight chance groups of one hundred. The approximate average deviation in these cases was respectively 1.2 and 0.7 combinations.

CONCLUSIONS

The study was conducted primarily in the hope of learning something of the value of standard scores for the measurement and understanding of the work of individuals in arithmetic by means of comparatively few samples. Test No. 1 of the Courtis series was chosen for study because averages had been found for it from a large number of children and because it was considered comparatively elementary. There is, of course, no telling how representative the process of adding single digits is. It is probably as simple as any process in arithmetic, and the presumption would be that the reliability of a single or a few trials in this process would be far greater than that of the more complicated processes which make up the important practical abilities in the subject. The results of the study show that a single or a few trials must be used with caution in determining the status of individuals in these abilities.

The unreliability of a few trials may be shown again by reference to the standard scores of Courtis based upon the results of the best 30 per cent of his group of some nine thousand children. His averages for this test range from 26 for the third grade up to 65 for the ninth grade, a difference of 39 combinations. Many of the children of the group studied here made up this amount of difference during the twenty-five trials, the average difference between the first and last being 28 combinations. Often the difference between several grades would be covered in the first two or three trials. A child's place on the Courtis scale would thus depend largely upon the number of trials he made.

The question remains as to whether it is possible to use the valuable scores of Courtis for the measurement of individuals. Because of the unreliability of one score from an individual it is clear that such a single score cannot be compared directly with an average of Courtis. And of course it is impossible to measure the

average of several scores of an individual against an average of first scores of many individuals. If, however, we may assume that the curve of improvement based upon 202 returns (Fig. 4) is representative of the rate of improvement of so large a group as the 1,370 eighth-grade children of Courtis, then we have a basis upon which to proceed. The average of first scores of the 202 children of this study is 51.5 combinations and the average of the median of twenty-five trials is 69. If about the same ratio should exist in the larger group of Courtis, which seems likely, the average of medians of twenty-five trials to correspond would be 69/51.5 of 57, his average of first scores, or 76.4 combinations. We may then say that the median of any eighth-grade pupil's twenty-five successive trials should approximate 76 combinations to compare favorably with what is normal in the country. Of the San Jose group about 33 per cent made this score. Or, if Courtis' standard score for the eighth grade of 63 combinations be used, then the pupil's median should approximate 84 combinations. Only 12.5 per cent of the San Jose group reached this score.

The conclusions of the study require qualification in that it has been assumed that a first trial is a definite thing, whereas it is of course largely relative to what has preceded it of a similar nature. Probably the 202 children of this group, as well as the eighth-grade children from whom the Courtis scores were derived, had not had practice in adding in the form of the test for several years, although the daily work in arithmetic must have given some continuous practice incidentally. Children practiced systematically on the precise form of the test would probably be more reliably measured by one trial if this should be made during or immediately after the training. Nothing can be said here of what this increased reliability would amount to. It would probably not justify the use of one or a few trials for a formal classification of individuals.

From a certain point of view the usefulness of the Courtis Test No. 1 may be questioned. It is plainly not a test of addition even when addition is limited to the handling of columns of figures and the rational side of the topic is disregarded. As has been noted, the ordinary process of addition is much more complicated than writing the sums of single digits. The value of the test as a measure of

addition as usually met with can be determined only after its correlation with the more inclusive process has been ascertained. It is doubtful whether the correlation is sufficiently high to warrant the use of the test for grading. Undoubtedly the better way would be to make use of a test more typical of addition as such. Unfortunately Courtis does not have a test of addition except as a part of a larger one on the four fundamentals. This has the effect of concealing the standing in any one fundamental process and so makes it inconvenient to discover just what special training a pupil needs. As an aid in the analysis of backwardness in addition when this has been found with the use of a satisfactory grading test, Test No. 1 would seem to be important—just how important can be known only after its correlation with adding ability has been determined, along with the correlations of the other important components of the ability, whatever they are.

A final word should be said of the ability examined by the test on the addition combinations. It has been understood throughout the paper as the ability to write with reasonable accuracy and intelligibility the sums of the possible combinations of single digits with average or normal speed. Accuracy and intelligibility in writing have been defined practically by eliminating returns passing certain limits, limits which have been described in the matter of accuracy. The limit of intelligibility was a rough one. If the figures could be definitely made out the papers were accepted.

But this raises a question. How is the writing of figures related to readiness of response in supplying the sums of the combinations mentally? Some children are doubtless held back very much by the difficulty of manipulating the pen or pencil. Others write about as fast as they can add. Just how children range between these limits is unknown. Perhaps this need not be a matter of concern for purposes of grading, for the ability to write combinations is a practical one that may be treated as a unit. But in searching for causes of backwardness it would be wholly desirable to distinguish between standing in writing figures and standing in readiness and accuracy of association in the combination of numbers as such. It is therefore quite possible that an oral response will prove more satisfactory for this purpose. It hardly seems possible that the

amount of improvement shown by the 202 children of this study is to be explained in terms of increased readiness of mental association alone. In fact, a noticeable depreciation in the quality of the writing and other signs of haste arouses the suspicion that a considerable part of it came from an increased facilitation of a neuromuscular sort in the manipulation of the writing instrument. But the determination of these issues must be left for future study.

BOOK REVIEWS

Mental Fatigue. By MAX OFFNER; translated by G. M. WHIPPLE. Warwick and York. Pp. vi+133.

This book is of the type of a number of works which have recently been written for the purpose of presenting in summary form for the convenience of teachers and educators the results of experimental investigations in a particular field which have a bearing upon educational practice. Of a similar nature are Watt's book on *Memory*, Heck's on *Formal Discipline*, Miss Thompson's on *Writing*, and Meumann's comprehensive work, which indeed includes all the fields which have been made the subject of investigation. Such books meet a very widespread demand and are evidence of the fruit which the new effort to apply the scientific method to the solution of educational problems is already bearing. The author of *Mental Fatigue* has presented a comprehensive and critical, and for the most part clear and concise, discussion of the literature of the subject. The interpretations and applications which follow the more technical presentation are given with due caution and reserve, and yet offer reasonably definite suggestions for practice.

After defining fatigue and drawing a distinction between mental and physical fatigue, the author discusses the various methods which have been tried for the measurement of fatigue. These are divided in general into physiological and psychological, according as the process which is tested is a physiological or a mental activity. The physiological methods assume that there is a close relationship between diminution in the capacity for physical and for mental work—sufficiently so that the degree of diminution in physical efficiency may be taken as a measure of mental fatigue. This relation has been found not to be so simple as was assumed, however, and resort has accordingly been had to the use of mental processes, such as the ability to discriminate between sensations or the speed and accuracy of computation, memory, etc., and it is upon the results of such tests that most of the conclusions are based.

In the next section the discussion deals mainly with the relation between fatigue and other factors in their effect upon the efficiency of work. The fluctuations in efficiency do not give a simple picture of the course of fatigue because of the effect of such factors as practice, "warming up," the initial and final spurt, etc. It is this complication which makes the testing of fatigue difficult. The author shows in this section the part which each of these factors may be expected to play.

Under the caption "Laws of Fatigue" are shown the course which fatigue itself may be expected to take, and the variations which occur in different persons and at different ages. This section also takes up in some detail the application of the principles of fatigue to the length of lesson periods, the length and distribution of pauses, longer and shorter, and to the fatigue effect of various studies and of various kinds and conditions of work. Finally in the last section certain general conclusions upon mental hygiene are drawn.

The book will be found of interest not only to teachers but to all as well who are concerned in the development of mental efficiency.

FRANK N. FREEMAN

THE UNIVERSITY OF CHICAGO

Fine and Industrial Arts in Elementary Schools. By WALTER SARGENT. Ginn & Co. Pp. 132.

Readers of the *Elementary School Teacher* will remember the articles by Professor Sargent which appeared in this journal two years ago. The present volume is a revision and enlargement of that series of articles.

The first two chapters deal with general principles and state the reasons why drawing, constructive work, and design should be included in the elementary course. The remaining five chapters contain detailed recommendations for the work of each of the grades.

The book commends itself to the student of elementary education because it seeks to find a place for art in elementary education which will put drawing and manual activity on the level with all the other subjects taught in the school. If drawing and constructive work are to take such a place in the schools, they must be organized so that from year to year the pupil shall progress and secure genuine mental development from his training. That it is very difficult to get a progressive series of exercises in drawing and constructive work everyone knows who has seen children struggling with school drawing-books and with repetitious manual-training exercises. In the second place, handwork of all types must be related to reading, writing, and number work. This can be done only when the value of practical activity for the training of powers of mind which are on a level with those trained in the intellectual subjects is understood and emphasized.

Professor Sargent has stated these principles in such a way as to stimulate the most wholesome thinking on the part of the elementary-school teachers and supervisors. Furthermore, he has illustrated the way in which the principles may be carried into practice from grade to grade.

C. H. JUDD

The Yearbook of the Francis W. Parker School. The Social Motive in School Work. Published by the Faculty of the School. Pp. 139. 35 cents.

The Francis W. Parker School was established as a memorial to Colonel Parker and it has continued to carry out the educational policy which he inaugurated. The present publication is the first of a series which is promised by the faculty of this school. It contains the reports of a number of different activities of the school. A general introductory statement of principles with which the volume opens is followed by an account of Investigation Lane. This account relates the way in which some land back of the school has been put to use as a means of educating the children through activity, and at the same time producing much experience that is valuable for the social life of the children and for their other school work. Later sections of the monograph give examples of the way in which the dramatic instinct of children may be employed. The organization of the music of the school is discussed. The print shop is reported in general and in some special details that are of importance in the work of the seventh grade. Altogether, the monograph is very suggestive of lines of activity which may be taken up in elementary education.

The authors of the book call attention in their announcement to the fact that the school is unhampered by traditions, and is therefore free to experiment in the course of study and in the methods of organizing teaching. The best characteristic

of the volume is its treatment in a definite, concrete way of the work which is actually being carried on in the school. One can see in these reports the vigorous life of a real school. The stimulus that comes from such concrete reports will certainly not be lost in the application of the general principles here set forth to schools less fortunate in equipment and in freedom to carry on experimentation.

C. H. J.

The Child in the City. A series of papers presented at the conferences held during the Chicago Child Welfare Exhibit. Edited by SOPHONISBA P. BRECKINRIDGE. Published by the Chicago School of Civics and Philanthropy.

During May, 1911, there was held at the Coliseum in the city of Chicago an exhibit of all of the activities in the city which are directed toward the improvement of conditions surrounding children in the home, in the school, on the street, or in the playground. This exhibit included not only the private and public educational agencies but also the philanthropic and medical activities which aim at the improvement of the hygienic conditions and moral conditions in the city.

This Child Welfare Exhibit was an enlargement of the exhibit which had been held in New York City a few months earlier. The materials from New York were brought to the Coliseum, and were supplemented by exhibition material from the city of Chicago itself. One notable feature of the exhibit was the series of conferences at which educators, philanthropists, and social workers discussed the various problems of child welfare. The addresses given at these conferences have now been brought together in a bulky volume edited by Miss Breckinridge. The book supplies a very good general survey of the activities in the city which make for the benefit of children. The addresses are divided into nine sections. After a brief introductory section which gives the addresses made at the opening of the exhibit, there is a section dealing with personal service. This section reports three addresses by Richard C. Cabot. Following this are sections on the physical care of children, on the school and the child, on special groups of children, on the working child, on the law and the child, on libraries and museums, on social and civic problems of childhood, and finally two addresses, one by Mrs. McCormick, whose generosity made possible the exhibit, and one by Mrs. Blaine who contributed with Mrs. McCormick to the support of the enterprise, and was largely instrumental in its organization. In each of these sections there is reported a number of addresses by specialists engaged in practical work with children. It would be difficult to select for detailed discussion any special papers from among the large numbers here presented.

The book ought to stimulate others to a similar series of conferences. The wholesome influence of these conferences in Chicago is felt long after the close of the exhibit itself. As a means of arousing the consciousness of a city to the necessity of improvement in all of these different lines of activity, nothing can be stronger than the united presentation of the different types of social activity in behalf of children. The material side of this exhibit was expensive, and probably cannot be reproduced in very many centers, but the conferences which are set forth in this volume could be reproduced at relatively slight expense, and the benefit of a series of such conferences is attested by the contents of the book itself.

C. H. J.

Vocational Education in Europe. Report to the Commercial Club of Chicago by EDWARD G. COOLEY. Published by the Commercial Club. Pp. 347.

This volume contains a report of an investigation which was carried on by Mr. Cooley during a year of visitation of European schools. A very full statement is made of the schools of Germany which have to do with vocational training. In somewhat briefer compass the industrial education of Austria is summarized and the industrial education of Switzerland. The volume gives the course of study of the various institutions, and some statement of their organization and support.

The part of the book which will undoubtedly be of most interest to general readers is that which sets forth the conclusions which Mr. Cooley has drawn from his studies. Mr. Cooley believes that there should be a general elementary education extending through a period of eight years before there is any special effort to give trade instruction. These eight years should be followed in the case of people who are going into industry by special instruction in the trades. This special instruction is the function of a group of institutions not yet fully organized in our American educational system. "Special schools managed by specially trained teachers a part of whom at least must be practical men from the industries" must be added to the general education system of the country. These schools will be of secondary grade and will provide for pupils who would not naturally go on with the general schools that are now in existence at the level of the high school and beyond.

Mr. Cooley makes one significant statement in his first general conclusion based upon his studies. He believes that it is worth while for us to attempt in America to revive and reorganize in some fashion the apprenticeship system which has fallen into disuse in our present-day civilization.

Whatever may be the individual opinion of various investigators and experimenters with regard to the best methods of introducing vocational education into American schools, there can be little doubt that Mr. Cooley's book will be read with very great interest by all teachers and supervisors of elementary schools. Probably the largest divergence of opinion will center about his position that this work is of secondary grade only and is not suitable for the general elementary school even in its upper classes. The practice is becoming so widespread of undertaking some industrial work in the later years of the elementary school that there will be very little disposition to accept without qualification Mr. Cooley's general position. In the meantime, a careful perusal of his reports from Europe will be of interest to all students of the subject. So far as the present reviewer can make out from a study of the first part of the book, there is relatively little justification for the belief that our American system is shut up to the one possibility which Mr. Cooley advocates. The freedom of our American school organization is so great and the virtues of much of the industrial training which Mr. Cooley has observed are so obvious that it would seem much more direct to advocate the conclusion that our American elementary schools should take on as a part of their regular work some of the types of training that have been found to be of such importance in the older civilizations of Europe.

C. H. J.

Social Aspects of Education. By IRVING KING. New York: Macmillan, 1912. Pp. xvi+425.

Educational literature bearing upon the social aspects of education has been very voluminous of late. It is to be found scattered, however, through numberless books

periodicals of every type, pamphlets, special bulletins, reports of local organizations, scattered speeches, etc. To cover the field it has been necessary to read a multitude of incoherent and repetitious matters. We have needed for economy in reading and for perspective and organization a book that would treat in systematic and related fashion the various social aspects of education; and at the same time present accounts of representative social movements that would adequately illustrate each particular aspect described.

Professor King's book does this for us in an admirable manner. Most of the important social movements relating to education are treated. They are grouped according to their relationships. Each is briefly but clearly interpreted in the beginning of the chapter devoted to it. The main body of the chapter is then given to source-materials illustrative of the movement in question written by one intimately in contact with it. Some of the writers drawn upon are: Dewey, Leipziger, Mero, Dean, Cooley, Royce, Burnham, Reeder, Kerschensteiner, Butterfield, E. J. Ward, Louise M. Greene, Colin A. Scott, Franklin W. Johnson, Professor G. H. Mead. Each writer naturally treats his specialty.

The book is divided into two parts. The first deals with the relations of the school as an institution to society in general and to all other social institutions that it is designed, or at least expected, to serve. The second part treats of the social life within the school in its bearing on the socialization of the pupils, the studies, methods, and school government.

Topics covered under Part I are: the social view of education; social origins of educational agencies; social opportunities of rural schools; home and school relationships; schools as social and civic centers; extension work among adults; the playground movement; social value of school gardens; vocational education; vocational guidance; education as a factor in social progress and social reform. Topics treated under Part II are: social life of the school; social organizations within the school; self-government in schools; social aspects of mental development; social atmosphere of the school as related to the learning process; corporate life of the school as related to moral education.

The book presents an excellent introduction to the field. It also points the way for intensive specialized work. Each chapter is followed by a list of problems and topics for further research, and by a full and carefully selected bibliography.

J. F. BOBBITT

THE UNIVERSITY OF CHICAGO

CURRENT EDUCATIONAL LITERATURE IN THE PERIODICALS[1]

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Librarian, School of Education, The University of Chicago

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[1] *Abbreviations.*—Chaut., Chautauquan; Child Wel. M., Child Welfare Magazine; El. School T., Elementary School Teacher; J. of Educa. (Bost.), Journal of Education (Boston); Lit. D., Literary Digest; Outl., Outlook; Pub. Lib., Public Libraries; Sci. Am. Sup., Scientific American Supplement; School R., School Review.

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